Eric Roselli

Dr. Kim Eagle: Hello, my name is Kim Eagle. I am the Hewlett Professor of Internal Medicine and one of the directors of the Frankel Cardiovascular Center at the University of Michigan. I also have the pleasure of being the chair of a study called GenTAC--it's genetically triggered aortic conditions. With a number of centers around the country, we're trying to get at the underpinnings of acute aortic disease and chronic aortic aneurysm disease caused by genetic factors.

I'm really please today to be joined by Dr. Eric Roselli. Eric is a staff surgeon at the Cleveland Clinic, Department of Thoracic and Cardiac Surgery. He's also on the teaching faculty at the Cleveland Clinic Learner College of Medicine.

Welcome, Eric.

Dr. Eric Roselli: Thank you.

Dr. Eagle: It seems to me that we're in a kind of a renaissance in cardiac surgery as we think about acute aortic syndromes. With the ability to use stent grafting and more modern techniques in cardiac surgery. The whole approach to this group of disorders seems to be evolving. In particular, I've noticed that you and some of your colleagues have talked about when a patient tears their aorta from the ascending aorta all the way say to the legs, not only repairing the aortic segment where the tear was, but potentially combining surgery of the ascending aorta and stent grafting is becoming, potentially, an option. And I think our viewers would be very interested in the evolution of that thinking and why.

Dr. Roselli: Sure. Thank you for that great question. It's something I've spent a lot of time thinking about. It's interesting, for the longest time we've been looking at acute aortic dissections with a focus on that acute period of time.

Dr. Eagle: Right.

Dr. Roselli: Hey – everyone will agree the number one goal is to have a living patient at the end of that emergency situation. But I think we've evolved a lot in the last decade or two where we've gotten a lot better, especially with an appreciation for the fact that centers that specialize in aortic surgery and acute aortic treatment are doing a better job with the acute outcomes of that disease. Whereas, for example, in Cleveland we've reduced the mortality from that emergency surgery to the single digits range, about five percent over the last decade. What that's allowed us to do, I think, is think about this disease not only during those acute phases but the way we want to treat it over the lifetime of a patient because they're really left with chronic disease when they have that tear that extends all the way through, as you mentioned. And with the advent of this new technology, as well as better imaging, hybrid operating rooms where we can perform multiple sort of modality treatment at the same place we've expanded some of these treatment options. A lot of the discussion about this idea of the so called "frozen elephant trunk" or adding the stent graft to the open surgery started with the thoughts of "well you know we fix the acute problem here, but we're often left with this problem downstream… maybe we should tackle it all at once".

Dr. Eagle: Right.

Dr. Roselli: Ah, with the thought of what's going to happen later.

Dr. Eagle: Mmm.

Dr. Roselli: My approach to the so called DeBakey Type I Dissection, the full extensive dissection, has actually evolved from initially placing the stent graft in a couple of patients where I was forced to do more extensive repair, to now applying it to all patients I see with that extensive dissection. Because I think the operation is simple enough with the technology that we can do that. And what we learned in our initial analysis of those patients is that it's not just the long term outcome that's important, but we're probably going to do better treating these patients acutely. What do I mean by that? When we looked at the first couple dozen patients where we did that procedure in, I was surprised to see that over forty percent of them presented with malperfusion. And so by doing this more extensive repair in a hybrid operating room where we can image their aorta immediately after a proximal aortic repair, we can determine what kind of flow they get to their organs downstream and we can address that at the same time. And so that's been sort of a serendipitous finding in this more extensive approach to the disease, is that I think we're going to see better outcomes for that emergency surgery for those really, really high risk patients, the ones who show up who aren't getting good blood flow to their organs downstream.

Dr. Eagle: Right, so if they're malperfused from the earlier onset, then doing the more extensive repair may deal with that. Is there any indication that we might prevent late dilation of that false channel in patients that have both the true lumen and the false lumen, even after an ascending repair?

Dr. Roselli: That's the hope. I think that we're slowly compiling some data to suggest that. Certainly there's some pretty good data that shows by adding the stent graft to the surgical repair we see more healing of the false lumen downstream.

Dr. Eagle: Early on…

Dr. Roselli: Early on… Whether that's really going to translate into the need for less intervention later on or better healing of the aorta and a better long term outcome, I think the studies will have to show that. What we need are probably some better disease specific devices for it.

Dr. Eagle: Right.

Dr. Roselli: You know, like right now we're using devices that are on the shelf that are designed for descending stent grafting through the groin.

Dr. Eagle: Right.

Dr. Roselli: And we're using them really in an off-label way to do those procedures. Its' not a big stretch from the way that they're sort of labeled for use, and we have a great experience of doing it that way. But we need more devices that are disease specific. We're going to see some trials coming out in the next few years where we'll have better devices that will allow us to disseminate that kind of therapy to other centers.

Dr. Eagle: Ok.

Dr. Roselli: And then we'll compile more data and I think we'll learn more about it.

Dr. Eagle: So the early stent grafts were largely developed for aortic aneurismal disease, weren't they?

Dr. Roselli: Correct.

Dr. Eagle: And now we're dealing with a completely different phenomenon, a friable maybe fragile aorta that's recently torn, where the kinds of stresses that the devices need to take perhaps is different and the ability to have that seat and hold without damaging the aortic elasticity, tt's a tremendous engineering nightmare, I think.

Dr. Roselli: Yeah… the latest iterations of a couple of devices have recently gotten the indication from use and dissections. And it's been kind of small modifications to the devices such as increasing the conformability across the curvature of the aorta that has allowed them to do that…

Dr. Eagle: Right.

Dr. Roselli: The nice thing about this, you know this "frozen elephant trunk" approach in open surgery is you're not totally counting on the device to do it all. Because at least the way we do it… the way I like to do it… I still suture part of the device in place.

Dr. Eagle: So you bring the device up through the leg?

Dr. Roselli: No…

Dr. Eagle: Or do you put it in directly?

Dr. Roselli: Actually, I deliver it directly through the aorta, but I deliver it over a wire that's been delivered up through the leg and I think that helps to make it safer.

Dr. Eagle: Sure. Now, with Type B dissection, there's been stent grafting used for some time. And I know there's debate about what's kind of the golden moment in a patient who's stable with Type B dissection. How long should you wait with that flap, and the false and the true channel to have the best result? Do we have similar issues with timing with acute Type A dissection?

Dr. Roselli: Well, I think that they're probably similar with regards to, you know, we have a window where we have the opportunity for the aorta to remodel.

Dr. Eagle: Yes.

Dr. Roselli: I think we've got to be careful on the Type A dissection that we don't try and treat too much aorta at one time, not so much because the aorta is fragile, because we're going to be suturing in place during the operation…

Dr. Eagle: Right.

Dr. Roselli: but because of the risks to the spinal cord…

Dr. Eagle: Sure.

Dr. Roselli: …and the neurologic risk.

Dr. Eagle: Right.

Dr. Roselli: The majority of data that's looked at the experience with this procedure for acute dissections and from international experiences. And in many of those experiences, the operation then described is not only the placement of the stent graft and a proximal repair, but a pretty complex repair of the aortic arch, which may be more feasible in a small, young, Asian patient. I know there's a large experience from China, many of those patients, the average age is the forties or fifties. American patients tend to be bigger and a little bit older, and maybe have more comorbidities. And so the concern is are we doing this bigger, more complex operation, is it going to be more difficult? I don't think necessarily, though, we have to do a complex arch reconstruction where we're rebuilding all the branch vessels. We can place a stent graft up into the aortic arch, suture it in and still do a simplified reconstruction where we're doing a single anastomosis.

Dr. Eagle: Hmmm…

Dr. Roselli: And keep the circa rest times to less than a half an hour or so and limit the risk for spinal cord injury and some of the neurologic complications. But again, that's where I think we need to have some more specifically dedicated devices for this kind of disease.

Dr. Eagle: Sure.

Dr. Roselli: Types A dissections are the most common presentation of dissections that we see.

Dr. Eagle: Right… yep. With the advent now of the ability to put in valves on a catheter, do you foresee a future where we'll be doing Type A dissection repair entirely through a catheter based approach?

Dr. Roselli: I think that it will be a good option for patients who don't have options, much like how we saw the transcatheter valve technology start.

Dr. Eagle: Right.

Dr. Roselli: Personally, I have experience with nine patients where we've done that. And so some of the patients who have been deemed inoperable for Type A dissections, and that constitutes anywhere from ten to twenty five percent of the population that's been described in the literature, it's not always because, you know, the operation is completely futile. In some of those patients the decision is made because the standard operation might be too much for them but if we can get them through the acute process…

Dr. Eagle: Mmm…

Dr. Roselli: they still have promise for a potentially decent life.

Dr. Eagle: Right.

Dr. Roselli: And so if the stent graft therapy evolves such that we can get a definitive repair of that dissected aorta… great, but maybe we just need to use that technology to bridge them through that acute phase to where we can get them to a definitive repair. I mean, that's what I've seen in a few of the patients that I've had.

Dr. Eagle: I see.

Dr. Roselli: And so I think we need to sort of open our minds to these other technologies and how they can be used for this particularly complicated disease.

Dr. Eagle: Yes. Well clearly the art of cardiac surgery is just that. And you and your colleagues at Cleveland Clinic have been world leaders in helping us see how to move the field forward and make it safer and more effective. I really appreciate your taking time today to talk to our audience about some of these very interesting concepts, Eric.

Dr. Roselli: Thanks, Kim. Thanks for the opportunity to discuss it. And as always, someone who has as much passion about aortic disease as you, I've enjoy our time together.

Dr. Eagle: Thank you.